

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 1998		2. REPORT TYPE		3. DATES COVERED 00-00-1998 to 00-00-1998	
4. TITLE AND SUBTITLE Atmospheric Environments for Modeling and Simulations				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Research Laboratory, Monterey, CA, 93943-5502				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES See also ADM002252.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 2	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Atmospheric Environments for Modeling and Simulations

John Cook

Naval Research Laboratory

Monterey, CA 93943-5502

Ph (831) 656-4785/Fax (831) 656-4769

Cook@nrlmry.navy.mil

Award number: N0001498WX400008 (NRL BE-35-2-21)

Web address: <http://www.nrlmry.navy.mil/~wakefiel>

LONG-TERM GOALS

The goal of this NRL base project is to develop a capability to quickly visualize the impact of the atmospheric environment on tactical operations.

OBJECTIVES

Provide a visualization tool kit to analyze and interpret tactical impacts due to environmental conditions. Utilize the popular client – server model but develop methods to minimize the network bandwidth required for graphics intensive operations.

APPROACH

Develop a layered, distributed software application to efficiently render environmental data located at remote sites over the network. Separate the data engine from the rendering package and build the network communication layer. Allow the end-state user full control over the visualization without re-transmitting the same data over the network. (Pedro Tsai (NRL), Brian Doty (COLA), and Audrey Wakefield (A&T) performers.)

WORK COMPLETED

A prototype JAVA-based environmental graphics tool kit was developed from the public domain Grid Analysis and Display System (GrADS) software package. GrADS was developed by the non-profit Center for Ocean-Land-Atmosphere Interactions (COLA) and is widely recognized in the meteorology community as a well-designed, efficient two-dimensional interactive graphics package. The design of GrADS which isolates the data engine from the rendering layer, makes it well suited for adaptation to the JAVA schema.

RESULTS

The ability of an inexperienced user to visualize environmental data located on a remote server has been improved. The prototype client application was demonstrated live at the American Meteorological Society (AMS) meeting in Phoenix, AZ, January 1998. The JAVA client application was run on a PC which was connected over the internet to the GrADS data server running at COLA. The user was able to locally render (and re-render) the remote data set with a single network transfer. Traditional network

applications require the remote server to re-render the data and re-transmit the graphics, thus unnecessarily consuming network bandwidth critical to the Navy.

IMPACT/APPLICATIONS

Visualization techniques that minimize network bandwidth have direct application to the On-Scene Tactical Atmospheric Forecast Capability (STAFC) and TESS/NC projects.

TRANSITIONS

The JAVA-GrADS technology has transitioned to the 6.4 SPAWAR PMW 185 project PE 0603207N X0513-05 (STAFC).

RELATED PROJECTS

Related projects within PE 0602435N are award numbers N0001498WX30164 (EM/EO Testbed) and N0001498WX40077 (Tactical Atmospheric Modeling System/Real-Time). The related 6.4 project under PE 0603207N is X0513-05 (STAFC).

REFERENCES

Tsai, P. and B. Doty, 1998: A prototype JAVA interface for the Grid Analysis and Display System (GrADS). Preprint, 14th Annual Inter. Conf. on Interactive Information. and Processing. Systems for Meteorology, Oceanography, and Hydrology, Phoenix, AZ.

IN-HOUSE/OUT-OF-HOUSE RATIOS

51% in-house, 49% out-of-house based on funding level.